Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: October 2003

Questions regarding this report should be directed to:

Ken Minn
California Department of Water Resources
Division of Environmental Services
3251 S Street
Sacramento, CA 95816-7017

Telephone: (916) 227-7520
kminn@water.ca.gov

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity. Specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of October, 2003, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of October was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for all the compliance stations (i.e. C-2, S-64, S-49, S-42, S-21) was 19.0 mS/cm during October 2003. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

The October Delta outflow was steady within the range of 3,000 cfs to 5,000 cfs for most of the month. It increased at the end of the month due to exports reductions at the Projects. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for October is listed below:

Month	Mean NDOI (cubic feet per second)
October	4,373

2.3 Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during October 2003 is listed below:

Month	Total Rainfall (inches)
October	0.00

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during October 2003 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
October 1 - 13	3 gates operating	Installed	Closed
October 14 - 28	3 gates operating	Installed	Open
October 29 - 31	3 gates open	Removed	Closed

This year, the 2003 salmon fish passage study was commenced on September 30, 2003 and was scheduled to conclude on November 11, 2003. The study involved three phases of gate operations. Phase I, from September 30 through October 13, 2003, had the configuration of gates operating, flashboards installed, and boat lock closed. Phase II, from October 14 through October 28, 2003, had the configuration of gates operating, flashboards installed, and boat lock open. Phase III, from October 29 through November 11, 2003, was with gates open, flashboards removed, and boat lock closed.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During October 2003, salinity levels at Collinsville(C-2), National Steel(S-64), and Beldons(S-49) varied between 8.0 mS/cm and 11.0 mS/cm, whereas at Sunrise Club(S-21) and Volanti(S-42), it varied between 11.0 mS/cm and 15.0 mS/cm as shown in Figure 1. At the two monitoring stations(S-97 and S-35) salinity levels ranged from 15.0 mS/cm and 18.0 mS/cm as shown in Figure 2. On September 30, 2003, the SMSCG operated in support of the 2003 fall salmon passage study. As a result of gate operation, salinity reduction at Beldons, Sunrise Club, and Volanti was noticeable in early October as shown in Figure 1. For Morrow(S-35) and Ibis(S-97), both monitoring sites started off at different salinity levels, however, by October 20, 2003, salinity levels at both locations converged to the same level, as shown in Figure 2. Although changes in salinity level at Morrow Club(S-35) appears to coincide with gate operation, salinity level at Ibis(S-97) were stable throughout the month and did not exhibit any correlation with gate operations. Overall, salinity levels were stable and well below the standard of 19.0 throughout October at all compliance and monitoring sites. At the end of October, salinity levels slightly increased.

Channel water salinity conditions in the marsh appeared to be influenced more by gate operations than outflow in October 2003 because outflow was low (i.e. 3,000 to 5,000 cfs) for the most part of October.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for October 2003 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations are similar to that of 1999, however, with slightly lower magnitude, except at S35 and C-2. S35 salinity pattern for October 2003 mimic that of 2000, where S35 was higher than S97. C-2 salinity pattern mimic that of 1999 and 1994, however, slightly higher magnitude than 1999 and lower magnitude than 1994 level. Compared to previous nine years, October 2003 salinity levels were ranked eighth in high Specific Conductance.

Table 1

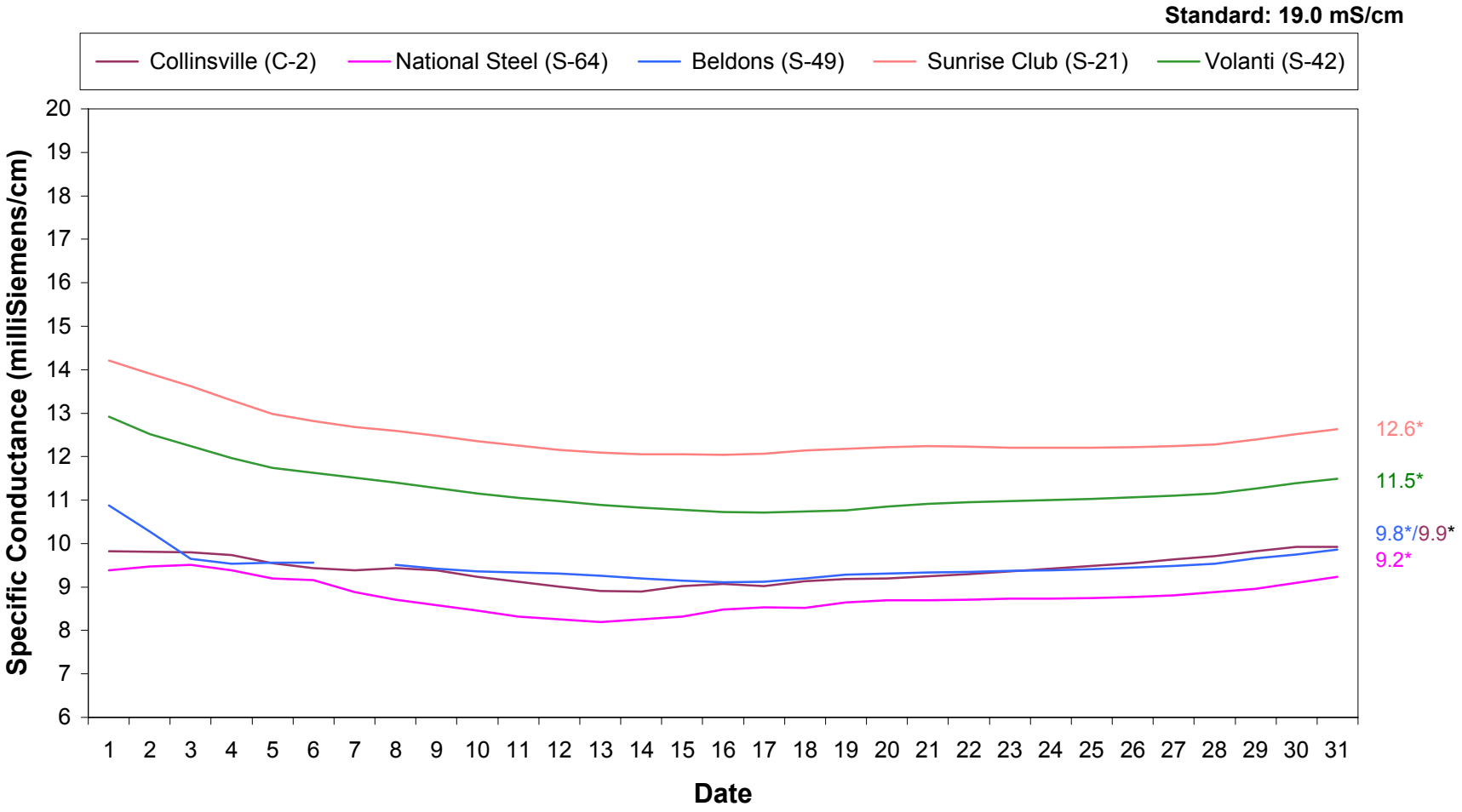
Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

October 2003

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	9.9	19.0	Yes
S-64	9.2	19.0	Yes
S-49	9.8	19.0	Yes
S-42	11.5	19.0	Yes
S-21	12.6	19.0	Yes

*milliSiemens per centimeter
**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance for October 2003



* = monthly mean specific conductance at high tide.

Figure 2. Suisun Marsh Progressive Mean High-Tide Specific Conductance For October 2003

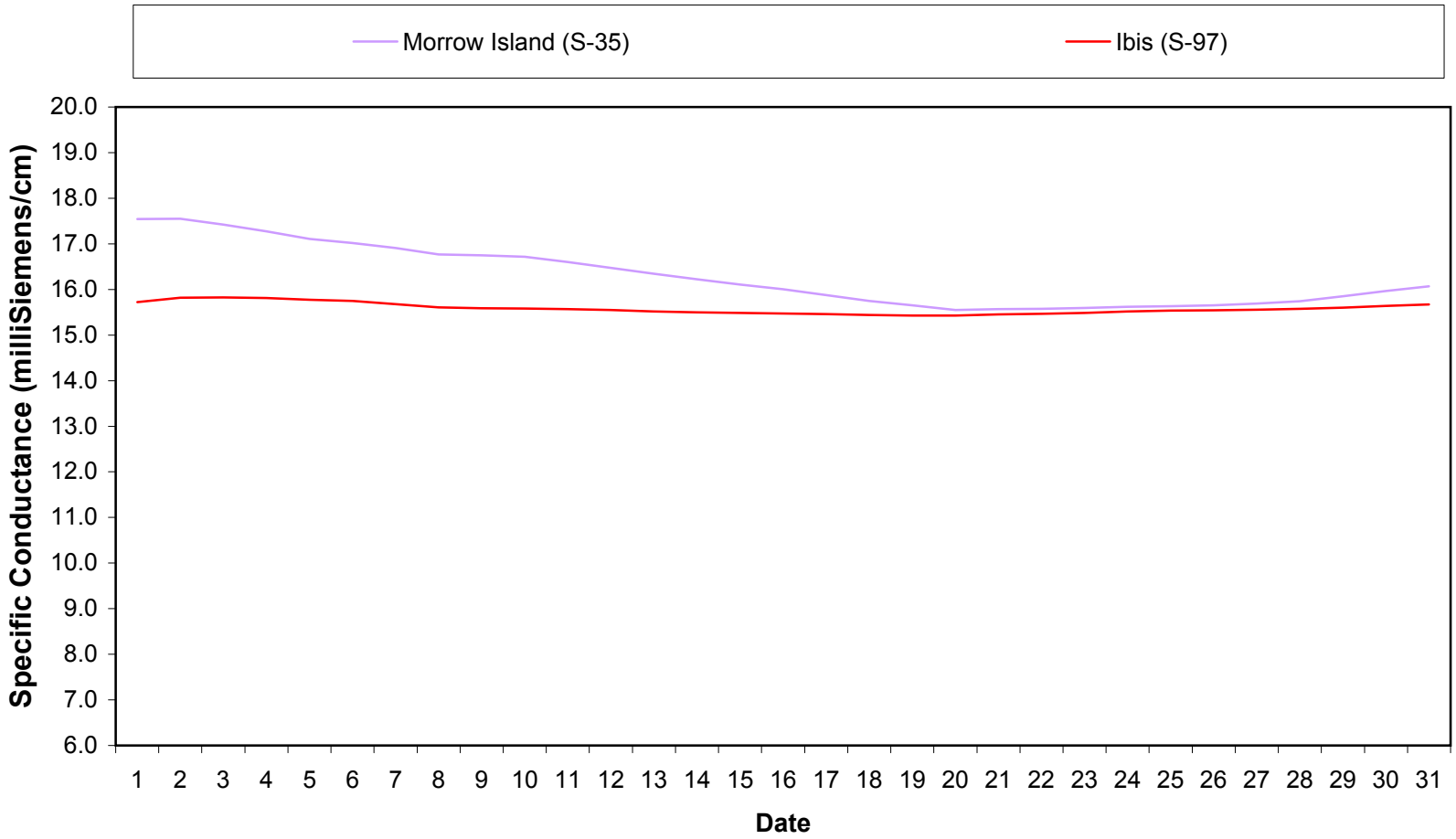
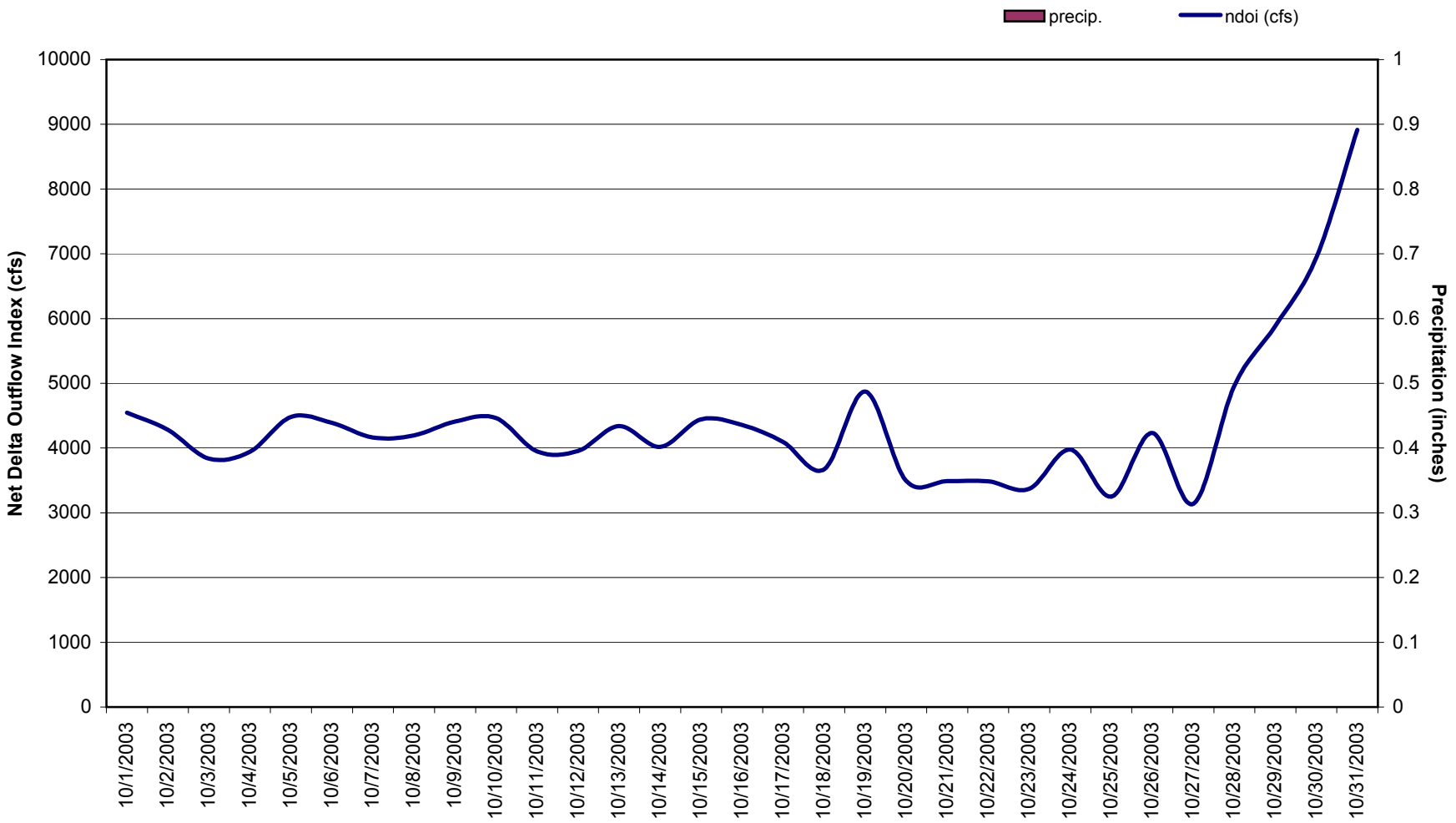
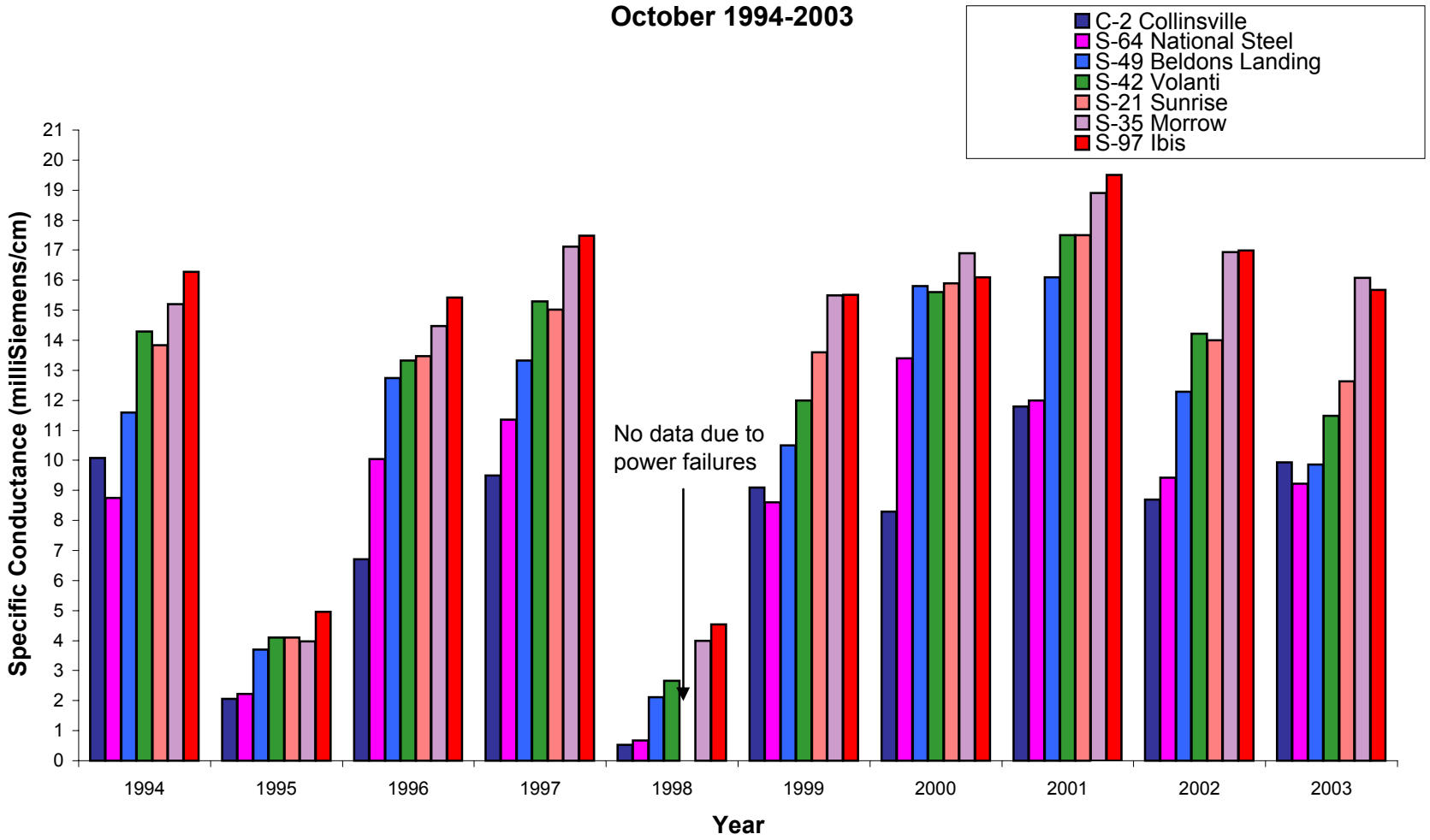


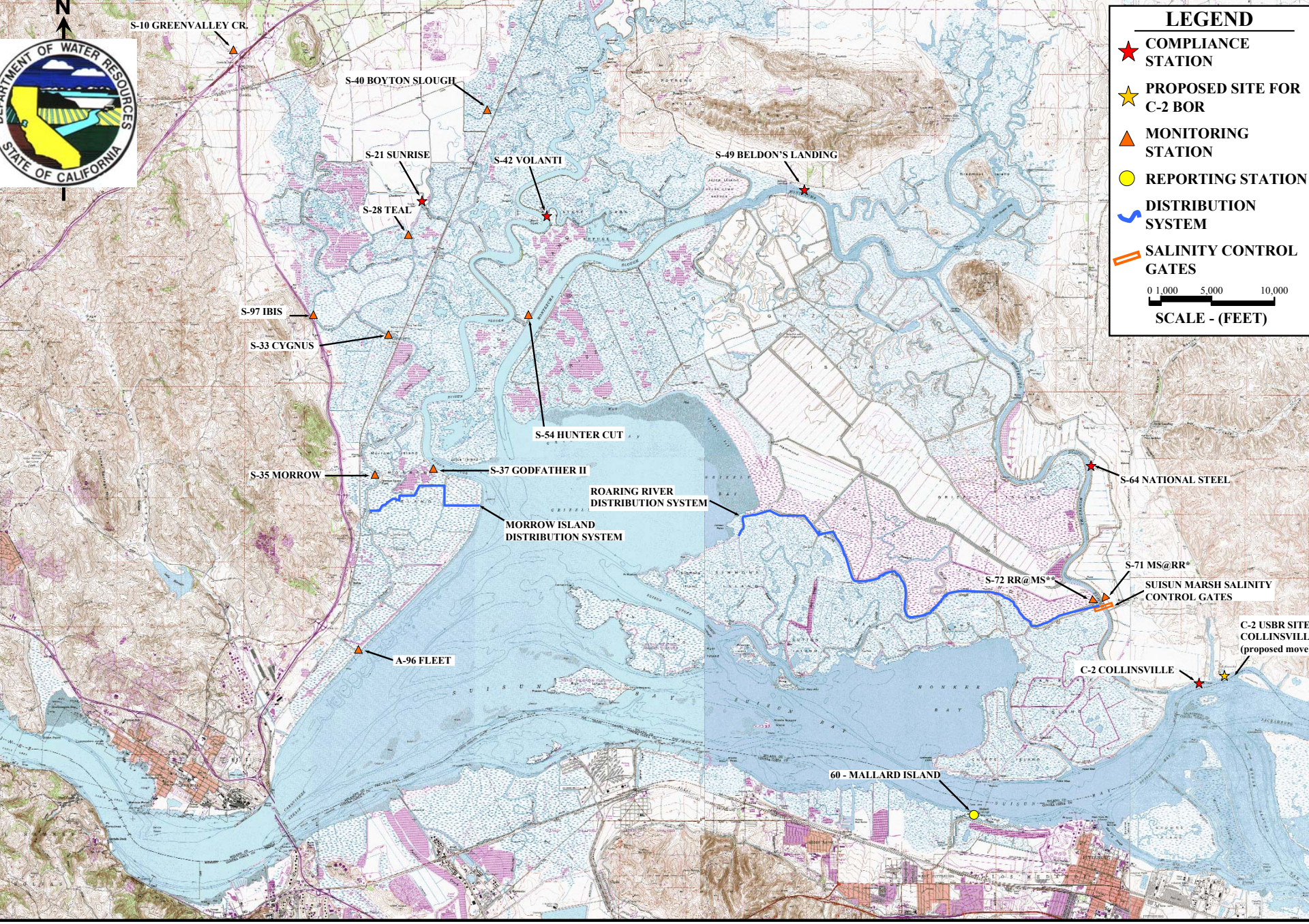
Figure 3. Daily Net Delta Outflow Index and Precipitation*
October 2003



*Preliminary DWR, O&M data; no precip resulted in October 2003.

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations October 1994-2003





SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES